

REMARKS

Applicants, by the amendments presented above, have made a concerted effort to present claims which more clearly define over the prior art of record, and thus to place this case in condition for allowance. Currently, claims 1 and 2 are pending.

Drawings

The drawings were objected to. Applicants submit replacement sheets of drawings. Applicants have amended Figures 5 and 6 to be designated by the legend "Prior Art". Applicants have amended Figure 7 to remove item q4 and the resistor between the output of q4 and the transistor gate Q1 to bring Figure 7 in line with the specification as originally filed on page 9, lines 19-27. Entry of the amended drawings is requested.

Specification

The specification has been amended to remove the bold print. Withdrawal of the objection is requested.

Claim Objections

Claims 1 and 2 were objected to because of informalities. Applicants have amended the claim to provide proper antecedent basis for the terms. In addition, Applicants submit that it is common knowledge to one of ordinary skill in the art that an H-bridge switching circuit includes upper and lower transistors. Reconsideration and withdrawal of the objection is requested.

Claim Rejections - 35 U.S.C. §112

Claims 1 and 2 were rejected under 35 U.S.C. §112. Applicant has amended the preamble of claim 1 to recite “An optocoupler circuit” and claim 2 has been amended to specify that the resistor is in series with the upper power transistor gate input. Reconsideration and withdrawal of the rejection is requested.

Claim Rejections - 35 U.S.C. §102

Claims 1 and 2 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by United States Patent No. 4,697,230 to Neft. Reconsideration and withdrawal of this rejection is requested in view of the amendments to the claims.

Neft discloses a high frequency circuit where the pulse-width modulation regulator U4 (Figure 6B) generates the gating pulses of SW1 and SW2 (via G1, S1 and G1, S2). As disclosed in Col. 9, lines 40-41, U4 provides the drive signals for SW1 and SW2. This is achieved when resistors R7 and R8 sense over current which is detected and isolated by a logic gate optocoupler U2 as disclosed in Col. 10, lines 2-4. The over current signal is buffered and latched to shutdown Q3 via Q2 and ultimately controlling U4 and providing feedback and control to SW1 and SW2.

Independent claim 1 has been amended to specify “said upper power transistor being directly driven by said collector phototransistor output at low frequency”. Unlike that disclosed by Neft, in the present invention the means for controlling the drive current senses the drive current from the optocoupler and ultimately slows the rate at which the upper power transistor Q1 is turned on. The purpose of the means is to prevent the turn-on of Q1 overlapping with the turn-off of Q2. Because of the slewed nature of operation of the present drive circuit, the drive circuit would be ineffective at high frequencies unlike the system

disclosed by Neft. Further, as only low frequency devices are required to drive the high side of the totem pole to facilitate the power supply on/off system as disclosed in Figure 4, the presently claimed invention as compared to Neft has the advantage of being very simple, driving the upper power transistor directly from an optocoupler collector output at low frequency.

Claim 2 specifies that the means is a series resistor. Neft requires a pair of resistors R7 and R8 to sense over current, the resultant output of which drives the optocoupler U2 which as a result ultimately controls the input to SW1 and SW2. The present invention as specified in the amended claims, however, uses the optocoupler drive output and the current limiting resistor in series with the gate of the upper power transistor Q1 to control the speed at which Q1 turns on.

Therefore, Applicants submit that claims 1 and 2 are patentable over Neft. Reconsideration and allowance of claims 1 and 2 is requested.

Claim 1 was rejected under 35 U.S.C. §102(b) as allegedly being anticipated by United States Patent No. 5,436,825 to Wawra et al. Reconsideration and withdrawal of this rejection is requested in view of the amendments to the claims.

Wawra uses a pulse transformer T connected to an upper transistor Q2 in a totem pole. Applicants submit the means of controlling the current to the upper transistor is using alternate switching on/off of transistors Q5 and Q6, plus the utilization of free wheeling diodes.

Independent claim 1 has been amended to specify "said upper power transistor being directly driven by said collector phototransistor output at low frequency". The claimed invention is novel and inventive over Wawra being effective for low frequency operation; it is

simple and as such more cost effective to implement. Further, the utilization of such a circuit will be effective in prolonging the meantime between failure compared to that of more expensive power transistor circuits.

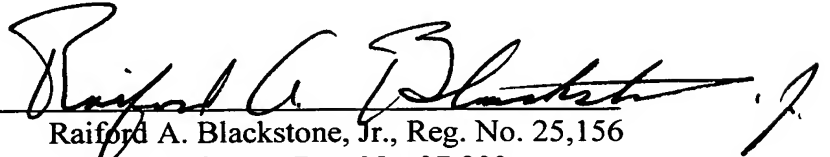
Therefore, Applicants submit that claim 1 is patentable over Neft. Reconsideration and allowance of claim 1 is requested.

In view of the above Amendments and Remarks, Applicant respectfully submits that the claims of the application are allowable over the rejections of the Examiner. Should the Examiner have any questions regarding this Amendment, the Examiner is invited to contact one of the undersigned attorneys at (312) 704-1890.

Respectfully submitted,

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